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IS 14562 (1998): Fire resisting computer media protection cabinets [MED 24: Security Equipment]



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केबिनेट — विशिष्टि
Indian Standard

**FIRE RESISTING COMPUTER MEDIA
PROTECTION CABINETS — SPECIFICATION**

ICS 97.140; 13.220; 35.220

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BUREAU OF INDIAN STANDARDS
MANAK BHAVAN, 9 BAHADUR SHAH ZAFAR MARG
NEW DELHI 110002

FOREWORD

This Indian Standard was adopted by the Bureau of Indian Standards after the draft finalized by the Security Equipment Sectional Committee, had been approved by the Heavy Mechanical Engineering Division Council.

This standard for fire resisting computer media protection cabinet covers the requirements for proper protection of computer media such as compact discs and floppy discs, etc. The protection required by the computer media is of very critical nature in terms of temperature and relative humidity. The limitations of temperature and relative humidity which the diskettes can withstand are 52°C and 85 percent.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test, shall be rounded off in accordance with IS 2 : 1960 'Rules for rounding off numerical values (*revised*)'. The number of significant places retained in the rounded off values should be the same as that of the specified value in this standard

Indian Standard

FIRE RESISTING COMPUTER MEDIA PROTECTION CABINETS — SPECIFICATION

1 SCOPE

This standard lays down the requirements regarding materials, sizes, details of construction, testing procedure and performance criteria of fire resisting computer media protection cabinets which afford security to computer media such as floppy disks, compact disks, etc. against fire.

2 REFERENCES

The Indian Standards listed in Annex A are necessary adjuncts to this standard.

3 NOMINAL SIZES

Nominal sizes of the cabinet shall be denoted by its internal height as specified in Table 1.

4 TYPES

The fire resisting computer media protection cabinets shall be of two types as follows:

Type FR 60 — cabinets having a fire resisting capacity of 60 minutes.

Type FR 120 — cabinets having a fire resisting capacity of 120 minutes.

5 MATERIALS

The different components of the fire resisting computer media protection cabinets shall be manufactured from material specified in Annex A.

6 DIMENSIONS AND TOLERANCES

The dimensions and the tolerances of the fire resisting computer media protection cabinets shall be as given in Table 1.

7 DESIGNATIONS

The cabinet shall generally be designated by type, nominal size and number of this Indian Standard.

Example:

A fire resisting computer media protection cabinet of type FR 60 and nominal size 400 shall be designated as:

Fire Resisting Computer Media Protection Cabinet
FR 60 × 400 IS 14562

**Table 1 Dimensions of Fire Resisting Computer
Media Protection Cabinets**
(Clauses 3 and 6)

All dimensions in millimetres.

Sl No.	Parameter	Nominal Size			
		400	500	600	
i)	Nominal size	400	500	600	
ii)	Nominal inside Dimensions (± 35mm)	Height	400	500	600
		Width	300	400	550
		Depth	450	450	450
iii)	Height of pedestal (± 35mm)	75	75	75	

8 CONSTRUCTION

8.1 The construction of the cabinet shall be either double cabinet type, that is, cabinet inside cabinet type, comprising of an external cabinet and an internal cabinet for body as well as door or a single cabinet type construction that is with single body and door

8.2 The joining of inner shell shall be such that there is minimum direct conduction of heat from outside to inside.

8.3 The fitment of body with the door shall be tongue and groove type to prevent direct passage of flame.

9 ASSEMBLY

9.1 The components shall be assembled by bolting, welding, rivetting or screwing or combination of the three.

9.2 The method of gas, arc and spot welding shall conform to IS 1323, IS 816 and IS 819 respectively.

10 FABRICATION

10.1 The internal cabinet shall be manufactured from steel, plastic, fibre-glass, wood, etc. and may be of single or double wall construction. In case of steel the sheet thickness used for internal cabinet shall be not less than 0.8 mm thick. In case of other material, suitable thicknesses may be used.

10.2 Shelf

Shelves shall be made from steel sheet not less than 0.8 mm thick and shall be of adjustable type for sizes 500 and 600.

10.3 Door

The door shall be fabricated from steel sheet of not less than 1.0 mm thickness without any burrs and dents.

10.4 Handle

Handles shall be made from cast brass, gun metal, zinc base alloy, aluminium or mild steel and shall be nickel chrome plated or powder coated.

10.5 Compression Mechanism

A continuous resilient packing shall be incorporated either in door or body and a compression mechanism shall be provided for clenching the door tight against the packing, thus providing protection against admission of moisture inside the cabinet.

10.6 Internal Fixtures

The cabinet shall be provided with one shelf for cabinets of nominal sizes 400 and 500 each and 2 shelves for cabinets of nominal size 600 . Further, internal fixtures such as shelves, racks or any other special requirement can be provided subject to agreement between customer and supplier.

11 SAMPLING

Two samples known to be fully representative of a lot of cabinets of similar design and construction shall be selected on the basis of random sampling by inspecting agency.

12 TESTS

12.1 Test for verifying fire resistant property of cabinets consists of fire endurance test and fire and impact test. For this purpose, one sample each, selected in accordance with 11, shall be subjected to fire endurance test (see 12.4) and fire and impact test (see 12.5) respectively.

12.2 Test Equipment

12.2.1 Contents

Contents of the fire resisting computer media protection cabinets subjected to these tests shall include minimum of 2 flexible diskettes and 2 compact discs procured and fully recorded by the test institute and shall be placed on the upper shelf in the centre and 25 mm away from the lateral walls and kept in hard plastic containers.

12.2.2 Thermocouple

12.2.2.1 Thermocouple enclosed in protection tubes of suitable material and dimensions shall have time constant of the protected thermocouple assembly within the range from 5 min to 7.2 min. A typical thermocouple assembly may be fabricated by fusion welding the twisted ends of chromé alumel wire not smaller than 0.52 mm² and not larger than 0.82 mm²

in cross section and mounting the leads in porcelain insulators so that the thermocouple head is 12 mm from the sealed end of the standard weight normal 12 mm diameter iron steel or inconel pipe.

12.2.3 Humidity Measuring Equipment

The relative humidity in the interior of the cabinet shall be recorded by means of electronic sensing elements that are accurate to within ± 1.5 percent and are to consist of transducers having resistance that varies with humidity.

12.2.4 Furnace

12.2.4.1 The furnace fuel and air supply shall be adjusted such that the fire is uniformly distributed over the exposed faces of the cabinet and regulated to temperatures in accordance with the Standard Time Temperature Curve.

12.2.4.2 The furnace temperature, corresponding to time elapsed as given in Table 2 shall follow the equation:

$$T - T_o = 345 \text{ Log}_{10} (8t + 1)$$

where

T = furnace temperature in °C at any time, t , in minutes, and

T_o = ambient temperature in °C.

12.2.4.3 The accuracy of the furnace control shall be such that the area under the time temperature curve, obtained by averaging all the furnace thermocouple readings, shall be within 10 percent of the corresponding area under the standard time temperature curve for one hour.

Table 2 Relationship Between Time Elapsed and Furnace Temperature

(Clause 12.2.4.2)

Time in Minutes	Furnace Temperature in °C
5	538
10	704
15	760
20	793
25	821
30	843
40	878
50	905
60	927
70	946
80	963
90	978
100	991
110	1001
120	1010

12.3 Preparations for Tests

12.3.1 The cabinet to be subjected to fire endurance test shall have a 12 mm diameter through hole at the bottom. A pipe of the same external diameter shall be

welded to outer and inner body sheets of the cabinet. This hole shall be used for insertion of thermocouple wires inside the cabinet. After insertion of the thermocouple wires through the hole it shall be sealed by proper insulating compound (which does not generate moisture on heating) from both ends of the hole.

12.3.2 All thermocouples shall be located 25 mm from the top of the cabinet interior. Four thermocouples shall be located 25 mm from the side walls, two of these being 25 mm from back and other two 25 mm from the inner face of the doors opposite the centre door joint.

12.3.3 The furnace temperature shall be recorded by thermocouples symmetrically distributed. At least four thermocouples shall be used, placed 50 mm from the exposed faces of the test sample including the door face.

12.3.4 The cabinet, to be subjected to fire endurance test, shall have humidity measuring sensor located midway from all inside surfaces.

12.3.5 The inside temperature of the cabinet at the start of the fire test shall be in accordance with IS 196. If the conditions in the cabinet are not within the range then it shall be conditioned to attain them for at least 12 hours prior to the fire test.

12.4 Fire Endurance Test

12.4.1 The sample of cabinet prepared in manner specified in 12.3 and filled with contents as specified in 12.2.1 is to be locked and then placed in the furnace.

12.4.2 The thermocouples to be placed inside the cabinet shall be mounted in porcelain insulators so that the thermocouple head is 12 mm from the sealed end of standard weight, nominal 12 mm diameter iron, steel or inconel pipe.

12.4.3 The furnace shall then be put on and the temperatures shall be read at intervals not exceeding 5 minutes during the test. Average of all the thermocouples inside and outside the cabinet shall be recorded and shall be taken as the required value.

12.4.4 The pressure in the furnace chamber during the test shall be maintained as close as possible to atmospheric pressure.

12.4.5 The furnace fire shall be continued for 60 minutes for FR 60 rating and 120 minutes for FR 120 rating. During the fire endurance test, it is essential that at no time the internal temperature of the cabinet as shown by the thermocouples placed inside the cabinet shall exceed 52 C, irrespective of ambient temperature. Also at no time the interior relative humidity of the cabinet shall exceed 85 percent.

12.4.6 After the specified period, the furnace is switched off. The cabinet is continued to be kept in the furnace for cooling without opening the furnace and temperature and relative humidity of the interior of the sample cabinet is to be continuously recorded until the temperature inside the cabinet decreases to 47°C or a temperature decrease of 2 C.

12.4.7 After the cabinet, inside the furnace, has cooled to about 47°C temperature, it shall be taken out from the furnace and its door shall be opened. The contents shall be examined to determine their usability in accordance with 12.6.

12.5 Fire and Impact Test

12.5.1 The cabinet to be subjected to this test shall have contents as specified in 12.2.1 and shall be subjected to test without any thermocouple and humidity sensors inside the cabinet.

12.5.2 The cabinet shall be subjected to a standard fire exposure in a manner similar to the fire endurance test for the period as shown below:

<i>Rating of Cabinet</i>	<i>Exposure Time in Minutes</i>	<i>Reheat Time in Minutes</i>
FR 60	30	30
FR 120	45	45

12.5.3 After the fire exposure time, the furnace shall be switched off and the test sample shall be withdrawn. The cabinet shall then be hoisted so that its bottom is 4 meters above a layer of brick rubble (30 cm depth) on a heavy concrete base and then dropped. Twenty minutes shall be elapsed from the time the furnace fire is extinguished until the cabinet is dropped.

12.5.4 After the impact, the cabinet shall be examined for deformation/damage.

12.5.5 Immediately after the impact, the cabinet shall be inverted, put back in the test furnace and again subjected to a standard fire exposure for the period of reheat time indicated in 12.5.2. Then the cabinet shall be allowed to cool to less than 47°C without opening the furnace.

12.5.6 After the cabinet has cooled to less than 47°C, the door shall be opened to examine its heat insulating properties, as evident by the usability of the contents in accordance with 12.6.

12.6 Criteria for Conformity

12.6.1 The fire resisting computer media protection cabinets shall be considered to be conforming to the requirements of this standard if they successfully pass the Fire Endurance Test (see 12.4), and Fire and Impact Test (see 12.5).

12.6.2 The fire resisting computer media protection cabinets shall be considered to have successfully

passed the Fire Endurance Test (*see* 12.4) and Fire and Impact Test (*see* 12.5) if the contents (*see* 12.2.1, 12.4.1 and 12.5.1) kept in the cabinet during the test are usable. The contents are considered to be usable after test if they are able to withstand ordinary handling without crumbling or falling apart and able to reproduce the data stored in them without the use of supplemented devices or aids of any kind.

13 PAINTING

13.1 All surfaces, shall be thoroughly degreased and cleaned of rust before application and rust proof primer.

13.2 Putty conforming to IS 419 shall be applied to all surfaces requiring filling. Two coats of undercoat and final coat paint conforming to IS 2074 shall be applied.

13.3 Finish shall be smooth, uniformly applied and free from visible defects. It shall be smooth and shall not readily chip or flake. The dry film thickness shall not be less than 0.1 mm and shall be polished to bring out luster or be in matt finish or stipple finish.

14 MARKING

14.1 A metal plate showing classification of cabinet together with the manufacturer's name and the year of manufacture shall be fixed on the inner face of the door.

14.2 Marking on Keys

The key shall be marked with an identification number which shall not be the same as the serial number of the cabinet.

14.3 BIS Certification Marking

14.3.1 The fire resisting computer media protection cabinets may also be marked with Standard Mark.

14.3.2 The use of the Standard Mark is governed by the provisions of *Bureau of Indian Standards Act, 1986* and the Rules and Regulations made thereunder. The details of conditions under which the license for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

15 INSPECTION

The purchaser or their authorised representative shall normally have access to the factory to inspect the fire resisting computer media protection cabinet at various stages of manufacture.

16 PACKING

Each cabinet shall be packed in accordance with the best trade practice with its door closed but not locked. The keys shall be separately sealed in a box and placed inside the cabinet. The keys may also be packed and despatched separately or delivered in some other manner if the purchaser so requires.

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BUREAU OF INDIAN STANDARDS

Headquarters:

Manak Bhavan, 9 Bahadur Shah Zafar Marg, New Delhi 110002
Telephones: 323 01 31, 323 33 75, 323 94 02

Telegrams: Manaksanstha
(Common to all offices)

Regional Offices:

Central : Manak Bhavan, 9 Bahadur Shah Zafar Marg
NEW DELHI 110002

Telephone
323 76 17, 323 38 41

Eastern : 1/14 C.I.T. Scheme VII M, V.I.P. Road, Maniktola
CALCUTTA 700054

{ 337 84 99, 337 85 61
{ 337 86 26, 337 91 20

Northern : SCO 335-336, Sector 34-A, CHANDIGARH 160022

{ 60 38 43
{ 60 20 25

Southern : C.I.T. Campus, IV Cross Road, CHENNAI 600113

{ 235 02 16, 235 04 42
{ 235 15 19, 235 23 15

Western : Manakalaya, E9 MIDC, Marol, Andheri (East)
MUMBAI 400093

{ 832 92 95, 832 78 58
{ 832 78 91, 832 78 92

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